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08/118,475	09/07/93	AFZALI-ARDAKANI	A IBM109A

EXAMINER	
DELCOTTO, G	
ART UNIT	**PAPER NUMBER**
1105	16

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11M1/0901

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This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☑ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), 0 days from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☑ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☐ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____.

Part II SUMMARY OF ACTION

1. ☑ Claims 53 - 81 are pending in the application.

   Of the above, claims _____ are withdrawn from consideration.

2. ☑ Claims 1-52 have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☑ Claims 53 - 81 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____. has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____ ; filed on _____.
13. ☐ Since this application apppears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

Part III DETAILED ACTION

Response to Amendment

Examiner acknowledges applicant's amendment filed September 7, 1993. Note that applicants have not filed a declaration showing that the prior art blends are not soluble in an organic solvent and that the composition of the present invention is soluble as stated in the Remarks filed on September 7, 1993.

Applicant argues that "polymer pairs in general are not miscible on the molecular level." The prior art teaches electrically conducting polymers, Lewis acid polymer dopants and solvents which are the same as those in the instant claims. Therefore if the components of the instant claims are miscible, one could reasonably conclude those of the prior art also exhibit this state. Applicant also states that the prior art teaches the addition of a separate third component to the blend which is not needed. While this third component is not necessary, applicant uses the term comprising which does not preclude the incorporation of a third component.

With respect to the prior art, applicant states that the prior art does not teach the reaction product of two polymers.

A reaction is defined in the Hackh's Chemical Dictionary, 4th edition, as a chemical change. A chemical change is clearly taught in the prior art references and, nowhere in the

instant claims does it specify the type of reaction taking place between the two reactants.

Applicant argues that the polymer/polyacid blends of the prior art teachings are not soluble in organic solvent. In response, as stated above, applicant's have not submitted the declaration that they said they would showing the differences in solubility between the instantly claimed composition and the prior art. Also, the prior art teaches the same solvents that are disclosed in applicant's specification used to dissolve the polymers and dopants. Since the prior art teaches the same polymer, dopants and organic solvents as the applicant, the examiner maintains that the polymers and dopants of the prior art are inherently soluble together in the organic solvent as claimed by applicant.

Applicant argues that the examiner is "picking and choosing so much of the aforementioned references to support his position and does not cover completely in the Office Action the full scope of what the references fairly suggest to one skilled in the art."

The prior art references broadly teach an electrically conductive composition containing an electrically conductive polymer and a polymer dopant, the method of making such a composition and articles formed therefrom. The examiner is using each reference independently to reject the claims. While all of the references do not contain a specific example disclosing each

of applicant's embodiments, the suggestion to do so is clearly stated in each patent. The skilled artisan would simply expect that the polymer dopants would produce results similar in degree to the other dopants listed and specifically demonstrated. Nothing unobvious is seen in doing so. Additionally, note that each reference teaches the shaping of the polymer material into useful articles.

The previous art rejections are maintained for the reasons set forth above and examiner has found additional prior art which rejects the instantly claimed invention.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Evaluations of the level of ordinary skill in the art requires consideration of such factors as various prior art approaches, types of problems encountered in the art, rapidity with which innovations are made, sophistication of technology involved, educational background of those actively working in the field, commercial success, and failure of others.

The "person having ordinary skill" in this art has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The evidence of record including the references and/or the admissions are considered to reasonably reflect this level of skill.

2. Claim 53-81 rejected under 35 U.S.C. § 103 as being unpatentable over Sakai et al, Wei, Jen et al and Tieke et al.

The present claims are drawn to an electrically conductive composition containing an electrically conductive polymer and a polymer dopant, the method of making such a composition and articles formed therefrom. The electrically conductive polymer and the polymer dopant can be selected from lists of well known conductive polymers and well known polymer dopants. Each of the references listed above teach an electrically conductive composition containing an electrically conductive polymer and a polymer dopant as claimed by applicant. Each reference teaches at least one embodiment of applicant's invention. While some of applicant's dependent claims recite a specific conductive polymer

with a specific dopant, nothing unobvious is seen in merely selecting a conductive polymer and a polymer dopant from lists of materials that are taught by the prior art.

Sakai discloses an electrically conductive composition, and method of making such, comprising a conductive polymer and a polymer dopant, which can be the same as those presently claimed. See columns 2 and 3. For example, Sakai teaches polypyrrole and polythiophene as polymers and teaches polyacrylic acid, polysulfonic acids and acids containing carboxylic groups as dopants. It would have been prima facie obvious for one skilled in the art to make an electrically conductive composition out of any combination of these polymers and dopants as Sakai clearly suggests that such may be done.

Wei discloses an electrically conductive composition, and method of making such, comprising polyaniline and a polymer dopant. The dopant can be polysulfonic acid and polyacrylic acid. See column 4, lines 4-8.

Jen discloses an electrically conductive composition, and a method of making such, comprising a polymer (heterocyclic vinylene) and a polymer dopant. The dopant can by polyacrylic acid and those containing carboxylic acid or sulfonic acid groups. See abstract and column 14, lines 57-65.

Tieke discloses an electrically conductive composition comprising a mixture of polyimide and polypyrrole. See abstract examples.

While all of the references do not contain a specific example disclosing each of applicant's embodiments, the suggestion to do so is clearly stated in each patent. The skilled artisan would simply expect that the polymer dopants would produce results similar in degree to the other dopants listed and specifically demonstrated. Nothing unobvious is seen in doing so. Additionally, note that each reference teaches the shaping of the polymer material into useful articles.

With respect to instant claims 80 and 81, each of the above stated references teaches the use of polyamic acid which inherently leads to thermal imidization.

3. Claims 53-81 are rejected under 35 U.S.C. § 103 as being unpatentable over Eisenbaumer in view of Sakai et al.

Eisenbaumer teaches solutions of electrically conductive substituted and unsubstituted polyanilines, methods of forming such solutions and the use of same to form conductive articles. See abstract. Eisenbaumer teaches forming the solution of the invention by dissolving the polyaniline, an oxidizing dopant, either separately or in combination as a doped polyaniline, in a solvent. See column 2, lines 45-50. In addition, Eisenbaumer teaches the method of forming the solutions of his invention is

not critical and can vary widely. For example one preferred method of forming the present solution containing the doped homopolymer or copolymer is to react, simultaneously, the unhoped polymer, the dopant and the solvent as a liquid. See column 9, lines 53-58.

With respect to the dopant material, Eisenbaumer teaches that the dopants may vary widely and can be such materials which are known in the art for use in doping conjugated backbone polymers to form conductive or semi-conductive polymers. See column 7, lines 14-45. In general, sufficient dopant is added to the polymer (in solution or in solid form of a plasticized composition) to form a doped polymer (either in the form of a plasticized composition or in solution) which is a semi-conductor or a conductor and which is soluble in organic solvents or which is plasticized by such solvents. See column 7, lines 50-56.

Eisenbaumer teaches that various methods are contemplated for using the solution of the present invention. The ability to form polymer articles by removing a solvent from a solution enables one to prepare articles of a wide variety of shapes and sizes. These articles can be fibers, films, molded articles and gels. See column 9, lines 15-20 and column 10, lines 10-45.

With respect to miscibility of the solution, Eisenbaumer teaches electrically conducting polymers, Lewis acid polymer dopants and solvents which are the same as those in the instant

claims with said conducting polymers and dopants being soluble in an organic solvent. Therefore, the examiner maintains that the polymer blend, soluble in organic solvent, inherently is miscible at the molecular level.

With respect to thermal imidization, since it is well known in the art that polyamic acid with a conducting polymer undergoes thermal imidization very easily, it would be obvious to one of ordinary skill in the art to thermally imidize the polyamic acid/polymer blend taught by Eisenbaumer since it is the same blend as that recited in the instant claims.

Although Eisenbaumer does not teach the use of polyacrylic acid as a dopant, oxidizing dopants are well known in the conductive polymer art, and Eisenbaumer teaches that any of such known oxidizing dopants can be used in the compositions taught therein. Eisenbaumer also teaches that dopants for use in the practice of his invention can vary widely and can be such materials which are known in the art for use in doping conjugated backbone polymers to form conductive or semi-conductive polymers. See column 7, lines 11-18.

Sakai et al teach that polyacrylic acid is a known dopant for a neutralized conductive polymer. See column 3, lines 50-65.

It would be obvious to one of ordinary skill in the art to use polyacrylic acid as the dopant in the conductive composition taught by Eisenbaumer since both Eisenbaumer and Sakai et al are

drawn to the production of the conductive polymer compositions and, additionally, since Eisenbaumer teaches the use of any known dopant in the art.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cao et al (US 5,232,631) disclose solutions and plasticized compositions of electrically conductive substituted and unsubstituted polyanilines in nonpolar organic fluid phases with funtionalized protonic acids. Yaniger et al (US 4,855,361) disclose a conductive polymer blend which comprises mixing a polyimide with a base-type polymer containing carbon-nitrogen linkages, such as polyaniline, having a polyimide-like group covalently linked to nitrogen atoms of the base-type polymer.

Remaining references cited but not relied upon are considered to be cumulative to or less pertinent than those relied upon or discussed above.

5. Applicant is reminded that any evidence to be presented in accordance with 37 C.F.R. 1.131 or 1.132 should be submitted before final rejection in order to be considered timely.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory R. Del Cotto whose telephone number is (703) 308-2519.

LINDA SKALING
PRIMARY EXAMINER
GROUP 1100

GRD
August 25, 1994